17 $2\sin^2 x + 3\sin x + 1$

$(2\sin x + 1)(\sin x + 1)$

$2x^2 + 3x + 1$

$(2x + 1)(x + 1)$

55 $\sin^2 x \sec^2 x + \sin^2 x \csc^2 x = \sec^2 x$

$\frac{\sin^2 x}{1} \cdot \frac{1}{\cos^2 x} + \frac{\sin^2 x}{1} \cdot \frac{1}{\sin^2 x}$

$\tan^2 x + 1 = \sec^2 x$

#67

$(\sec x + \csc x)(\cos x - \sin x) = \cot x - \tan x$

$\cancel{1} \underbrace{- \sin x \sec x}_{-\tan x} + \underbrace{\cos x \csc x}_{+\cot x} - \cancel{1}$

$\cot x - \tan x$

(8) $\frac{(1+\cos x)\cos x}{(1+\cos x)\sin x} + \frac{\sin x}{1+\cos x}\cdot\frac{\sin x}{\sin x}$

$$\frac{\cos x + \cos^2 x + \sin^2 x}{(1+\cos x)\sin x} \Rightarrow \frac{(\cancel{\cos x + 1})}{(\cancel{\cos x + 1})\sin x} = \frac{1}{\sin x} = \csc x$$

(18) $4\tan^2 x + \tan x - 3$ think $\overset{1\cdot 4,\ 2\cdot 2}{4x^2} + x \overset{1\cdot 3}{-3}$

$(4\tan x - 3)(\tan x + 1)$

$(4x - 3)(x + 1)$

1·12
2·6
4·3

	$4x$	-3
x	$4x^2$	$-3x$
1	$4x$	-3

mult
$-12x^2$
$4x$ $-3x$
x
middle term
add

(40) $\sin^2 x + \tan^2 x + \cos^2 x = \sec^2 x$

$1 + \tan^2 x = \sec^2 x$

$\sec^2 x = \sec^2 x$

(44) $\dfrac{\cos x}{\sin x \cot x} = 1 \rightarrow \dfrac{\cos x}{\frac{\cancel{\sin x}}{1} \cdot \frac{\cos x}{\cancel{\sin x}}} \Rightarrow \dfrac{\cos x}{\cos x} \Rightarrow 1$

49

$$\frac{1+\sin x}{1+\sin x}\cdot\frac{1}{1-\sin x}+\frac{1}{1+\sin x}\cdot\frac{1-\sin x}{1-\sin x}=2\sec^2 x$$

$$\frac{1+\sin x}{1-\sin^2 x}+\frac{1-\sin x}{1-\sin^2 x}=\frac{2}{1-\sin^2 x}=\frac{2}{\cos^2 x}$$

$$=2\cdot\frac{1}{\cos^2 x}$$

$$=2\sec^2 x$$

(63)

$$\frac{\tan^2 x - 1}{\sec^2 x} = \frac{(\tan x - \cot x)}{\tan x + \cot x} \cdot \frac{\tan x}{\tan x}$$

$$\frac{\tan^2 x - 1}{\sec^2 x} = \frac{\tan^2 x - 1}{\tan^2 x + 1}$$

$$\frac{\tan^2 x - 1}{\sec^2 x} = \frac{\tan^2 x - 1}{\sec^2 x}$$

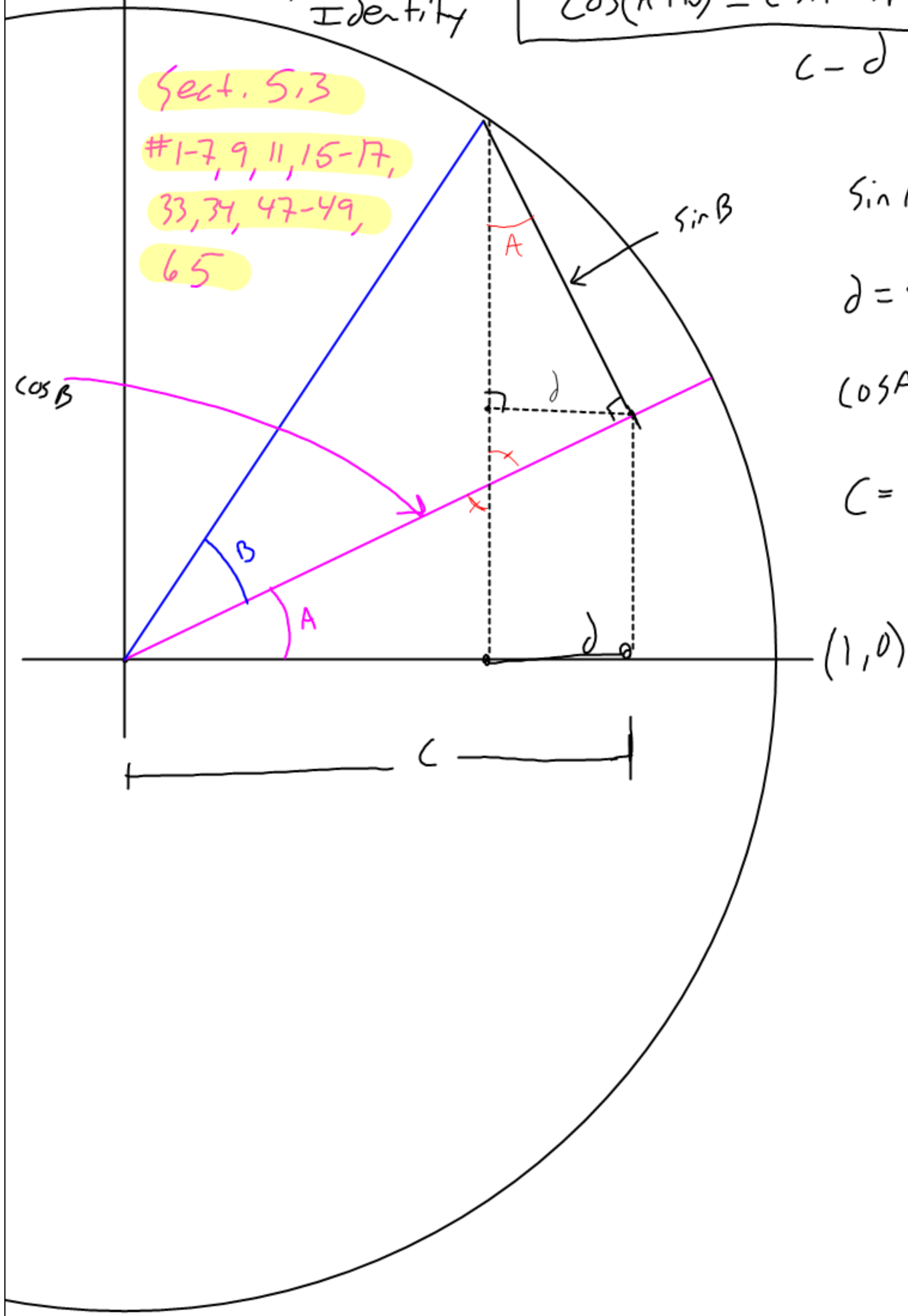
Sum Identity

$$\boxed{\cos(A+B) = \cos A \cos B - \sin A \sin B}$$

$$c - d$$

Sect. 5.3

#1-7, 9, 11, 15-17, 33, 34, 47-49, 65



$\sin A = \dfrac{d}{\sin B}$ (little Δ)

$d = \sin A \sin B$

$\cos A = \dfrac{c}{\cos B}$

$c = \cos A \cos B$

Difference Identity for Cosine

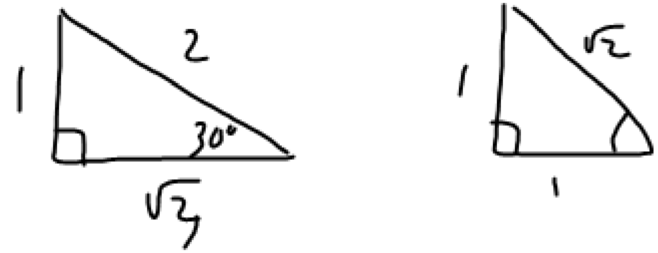
$\cos(A-B)$

$\cos(A+-B) = \cos A \cos(-B) - \sin(A)\sin(-B)$

$= \cos(A)\cos(B) - \sin(A)\cdot -\sin(B)$

$$\boxed{\cos(A-B) = \cos A \cos B + \sin A \sin B}$$

Find the exact value of $\cos(75^\circ)$



$$\cos(45^\circ + 30^\circ) = \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ$$

$$\downarrow$$

$$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$$

$$\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

① Find the <u>exact</u> value of each expression.

$\frac{\pi}{2} = \frac{6}{12}$

$\frac{\pi}{3} = \frac{4}{12}$

$\frac{\pi}{4} = \frac{3}{12}$

$\frac{\pi}{6} = \frac{2}{12}$

ⓐ $\cos 15°$

$\cos(45-30) = \cos 45 \cos 30 + \sin 45 \sin 30$

$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$

$\frac{\sqrt{6}+\sqrt{2}}{4}$

ⓑ $\cos \frac{5\pi}{12}$

$\cos\left(\frac{\pi}{4}+\frac{\pi}{6}\right) = \cos\frac{\pi}{4}\cos\frac{\pi}{6} - \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{6}\right)$

$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6}-\sqrt{2}}{4}$

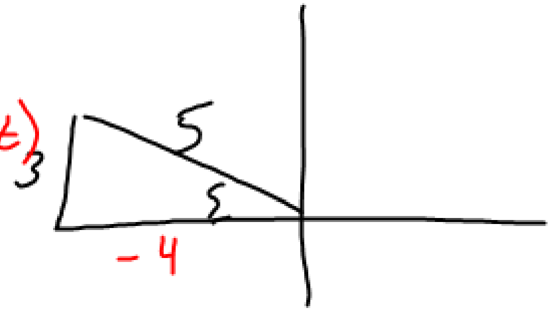
ⓒ $\cos 87° \cos 93° - \sin 87° \sin 93°$

$\cos(87+93)$

$\cos(180) = \boxed{-1}$

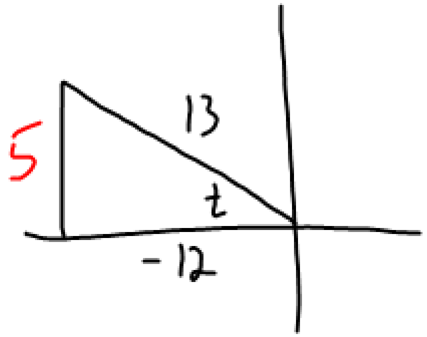
If $\sin(s) = \frac{3}{5}$ and $\cos(t) = -\frac{12}{13}$ in Quad II

Find $\cos(s+t)$.



$$\cos(s+t) = \cos(s)\cos(t) - \sin(s)\sin(t)$$

$$\frac{-4}{5} \cdot \frac{-12}{13} - \frac{3}{5} \cdot \frac{5}{13}$$



$$\frac{48}{65} - \frac{15}{65} = \frac{33}{65}$$